REMARKS:

Applicants respectfully request reconsideration and withdrawal of the outstanding Office Action rejections based on the foregoing amendments and following remarks.

Claims 1, 16, and 33 have been amended by incorporating the subject matter of dependent claims 4 and 15, 19 and 31, and 36 and 48, respectively. Claims 4, 15, 19, 31, 36 and 38 have been canceled. Thus, no new matter has been added.

Claims 1-15, 33-49 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states that the phrase "providing a saponified solution comprising a pyridine-2,3-dicarboxylic acid ester and a base" of claim 1 is unclear since a saponified solution contains an ester that has been hydrolysed from an ester to a carboxylate salt. Applicants submit that claim 1 was amended by way of a preliminary amendment dated January 3, 2006 to recite "providing a saponified solution comprising the product produced by adding a base to a pyridine-2,3-dicarboxylic acid ester" and is believed to be clear and definite.

Claims 33-49 were rejected as being incomplete under 35 U.S.C. 112, first paragraph, for omitting essential steps amounting to a gap between the steps. The Office Action states that the step of "converting the intermediate pyridine-2,3-dicarboxylic acid to the 2-(2-imidazolin-2-yl)nicotinic acids, esters, and salts" has been omitted. The cited MPEP §2172.01 refers specifically to "matter disclosed to be essential to the invention as described in the specification or in other statements of record". However, MPEP §2164.08(c) explains what features are considered not critical: "broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality". As pointed out on page 11, lines 26-27 of the specification, the conversion of pyridine-2, 3-dicarboxylic acid to the 2-(2-imidazolin-2-yl)nicotinic acid is well known in the art. Reference is made to U.S. Patent Nos. 4,658,030 and 4,782,157 on page 11, line 30 of the present specification as art exemplifying that processing steps for conversion were routine and familiar to those skilled in the art at the time of the present

invention. Thus, any known method may be utilized for this conversion and none of the steps in the conversion is essential or critical and an expert can easily practice the invention by following the steps disclosed in the art.

Claims 9 and 10 have been rejected for not specifying the amount of oxidizing agent required to cause a change in color. The Office Action states that the claims are additionally unclear since an amount of oxidizing agent effective to remove impurities will be the amount necessary to change the color of the saponification mixture to a lighter color. Claim 9 has been amended to recite "the method of claim 1 wherein said amount of oxidizing agent is an amount that changes the color of said saponified solution from a darker color to a lighter color". Thus, upon reading the present claims, one of ordinary skill would know to add oxidizing agent in an amount sufficient to observe a change from darker color to a lighter color.

Claims 1-10 were rejected under 35 U.S.C. 103(a) as being obvious in view of Cauwenberg et al. (U.S. Patent 6,133,450). Cauwenberg discloses using specific pH and feed pressure to purify pyridine-2,3-dicarboxylic acid using nanofiltration. Cauwenberg does not teach or suggest a method of in-situ removal of impurities using an oxidizing agent as recited in claim 1 of the present application. Claim 1 has been amended to specify the specific structure of the pyridine-2, 3-dicarboxylic acid ester and the identity of the oxidizing agents. The presently claimed methods have distinct differences and advantages over prior art methods of removing impurities from pyridine-2, 3-dicarboxylic acid esters. The present methods are advantageous over the prior art since the present methods produce higher yields of highly pure pyridine-2, 3-dicarboxylic acid esters using common, inexpensive oxidizing agents and do not require any special equipment.

Furthermore, Cauwenberg does not disclose or make obvious a method of in-situ removal of impurities in the specific pyridine-2, 3-dicarboxylic acid ester identified in present claim 1 using oxidizing agents, the concentrations of said agents, or the amounts of oxidizing agents sufficient to cause a change in the color of the saponification solution as is the subject matter of claims 5-10. None of the art cited show that the method of purification

recited in the instant claims was known in the art at the time of the present invention. Thus, it would not have been obvious to one of ordinary skill to remove impurities from a pyridine-2, 3-dicarboxylic acid ester by reacting a saponified solution with an oxidizing agent.

Claims 16-18 were rejected under 35 U.S.C. 103(a) as being obvious over Van Der Puy et al. Van Der Puy relates to converting pyridine carboxylic acid salts or esters into diacids using 5% NaOH and elemental fluorine. The Office Action states that "the difference between the prior art process and the instantly claimed process is the teaching of a pyridine, 2,3-dicarboxylate versus a pyridine 2,3-dicarboxylic acid ester to which a base is added". The Examiner has acknowledged that the step of saponification is missing in the cited art, but asserts that it would have been obvious to one of ordinary skill to modify the prior art process using saponification to hydrolyze the pyridine-2,3-dicarboxylic acid ester to the corresponding carboxylate. We respectfully disagree.

Independent claims 1, 16 and 33 have been amended to recite the specific structure of the pyridine-2,3-dicarboxylic acid ester and the identity of the oxidizing agents. The specified structure excludes the 1,6-dihydro-6-oxo- pyridine-2,3-dicarboxylate of Van der Puy. Furthermore, fluorine is not used for any step of the present invention. Van der Puy does not teach or suggest adding acid to a saponified solution, nor does it relate to purifying, then acidifying and collecting a diacid from a saponified solution comprising the pyridine-2,3-dicarboxylic acids of the present claims. Thus, it would not have been obvious to one of ordinary skill to modify the prior art process to obtain the process of the present invention.

Moreover, if one compares the products produced by the methods of Van Der Puy with the purified saponified pyridine-2,3-dicarboxylic acid ester produced by the present methods, one realizes the clear advantages of the presently claimed methods. Van Der Puy discloses a multi-step process comprising bubbling with N_2 and F_2, redissolving in dichloromethane, washing with brine, drying in $MgSO_4$, evaporating, recrystallizing from toluene, and refluxing with 5% NaOH for 3 hours.

The present invention does not require the large number of reaction steps, reactants, and equipment of Van Der Puy thus reducing manufacturing costs and saving time. Furthermore, the process of Van Der Puy yields approximately 31.5% of the corresponding diacid (90% of 1.05g powder recovered from 3.0 g pyridine-2,3-dicarboxylic acid solution) in the experiment using Dimethyl 1,6-dihydro-6-oxo-pyridine-2,3-dicarboxylate on pages 4391-4392 of Van Der Puy, compared with approximately 60.3% (98.9% of 61.0g recovered from 100g crude diester) in the working example of the present invention. It is clear that the claimed process shows an unexpectedly higher yield of diacid when compared to the cited art. Thus, the assertion that "the only difference between the cited art and the present invention is the replacement of one purification method with another" is misguided since a purification method that produces higher yields, purer products, at lower cost is clearly a valuable, novel, and non-obvious invention.

Claims 1-49 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The Examiner states that the "saponification mixture of crude diester" disclosed in Example 1, page 12, line 6 of the specification conveys neither the structure of the crude diester nor the structure of the diacid produced. It is obvious that the saponification mixture of crude diester in Example 1 is identical to the saponification mixture of the pyridine-2,3-diester according to the invention, e.g. based on page 9, lines 28-29 or page 10, line 7. The specification also lists structural details of the pyridine-2,3-diester on page 4 in flow diagram I (right structure). Independent claims 1, 16, and 33 have been amended to incorporate the specific structure of pyridine-2,3-dicarboxylic acid ester disclosed on page 4 of the specification.

The Office Action asserts that there is a lack of a working example in which 2-(2-imidazolin-2-yl) nicotinic acids are produced, and examples wherein oxidizing agents other than hydrogen peroxide are used. It is asserted that the state of the art is not predictable and it is not known if all other oxidizing agents will behave similarly in removing impurities from a saponified solution of pyridine-2,3-dicarboxylic acid

ester. There is no reason to doubt that other oxidizing agents would not similarly remove impurities from a saponified solution of pyridine-2,3-dicarboxylic acid ester. Attached hereto is a Rule 132 Declaration executed by Dr. David A. Cortes providing supplemental examples A-F using the presently claimed methods to remove impurities from three different diesters using three different oxidizing agents that fall within the scope of the present claims. In the Declaration, Dr. Cortes describes examples A-F carried out using the standardized procedures described in paragraphs [0015] to [0030] of the published application. In particular, the supplemental examples described in the Declaration show that the present methods are not limited to the investigated compounds in Example 1, but instead are useful for the in-situ removal of impurities according to the diester structures specified on page 4 lines 12-27 of the specification and presently claimed.

In view of the above remarks, claim amendments, and accompanying supplemental examples and results, Applicants believe that the rejections set forth in the March 24, 2008 Office Action have been fully overcome and that the present claims fully satisfy the patent statutes. Applicants therefore believe that the application is in condition for allowance. The Examiner is invited to telephone the undersigned if it is deemed to expedite allowance of the application. No new matter has been added.

Respectfully submitted,

By _____

Robert B. Murray
Attorney for Applicant
Registration No. 22,980
ROTHWELL, FIGG, ERNST & MANBECK
1425 K. Street, Suite 800
Washington, D.C. 20005
Telephone: (202) 783-6040

RBM/AH
1485379